DOCUMENT RESUME

ED 088 840 SP 007 811

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TITLE Prototype for Change: A Teacher Education Program.
PUB DATE [71]
NOTE 24p.

EDRS PRICE MF-$0.75 HC-$1.50
DESCRIPTORS *Educational Assessment; *Educational Change; *Educational Strategies; *Performance Based Teacher Education; Preservice Education; Student Teachers; *Teacher Education; Teacher Educators; Teacher Evaluation

ABSTRACT

This paper presents a model dividing the teacher education process into four sub-systems: assessment, management, curricular experiences, and supportive resources. Emphasis is placed on the teacher role of manager of learning experiences. Ninety performance objectives are arranged in 18 capsulized skill areas each of which consists of: a) a list of objectives to be met; b) a test battery to determine whether the student has met capsule objectives; and c) a performance component which requires the student to present written and videotaped evidence that he has met capsule objectives. This model requires attitudinal change by both the teacher candidate and the teacher educator. The candidate must be willing to engage in self-initiated instruction, frequent self-assessment, and evaluation of and by his peers. The teacher educator must be prepared to enter into cooperative interactive learning experiences with each candidate, and to become involved with public school practitioners, community, and lay people. Implementation of this model at the University of Kentucky required four years to develop and revise the following program materials; criteria, test batteries, post program measures, screening devices, instructional capsules, simulation experiences, knowledge measures, orientation programs, and stimulation techniques. (HMD)

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PROTOTYPE FOR CHANGE: A TEACHER EDUCATION PROGRAM

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Teacher education programs across the nation have suddenly found themselves in a New Age of American Education, the Age of Accountability. From within colleges of education the sounds of consternation and rethinking can be heard. Dwight Allen has led higher education's response to the call for educational innovation in the preparation of teachers. He (Allen & Mackin, 1970; Allen & Hawkes, 1970) has argued for changes in the substance of teacher education rather than in the polemics related to teacher education. We support his demand for commitment of funds from within teacher education programs to bring about these changes.

The combined effects of social clamor for more effective programs for tomorrow's teacher education has again raised the proverbial question: How do you know a 'good' teacher when you see one? In an effort to internalize the public concern for teacher effectiveness, we must struggle with the following "in-house" issues:

- How can teacher education programs demonstrate their own faculty's effectiveness?
- How can the program show that some faculty are more efficient and effective with certain types of students?
- How can these programs demonstrate that some instructional techniques are more effective with certain kinds of teacher education students?
- How can teacher education programs demonstrate that certain learning experiences are more effective than other program experiences?

The answers to these questions probably will be found when a prototype program is established to demonstrate empirically the usefulness of each element in the teacher education program. The remainder of this paper is our attempt to suggest what one prototype program would embody.

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Prototype for Teacher Education

At the first level of conceptualization the application of general systems theory to teacher education delimits systematic boundaries and provides a frame of reference for subsequent levels of abstraction (Banathy, 1971). In Figure 1 a field system model for teacher education is presented. In our conceptualization of a teacher education system we pay particular attention to the subsystems within the process function. Each of these four subsystems, assessment, management, curricular experiences, and supportive resources bear a logical and interdependent relationship with each other. Feedback information, derived from the practitioner influences the process function and the student's input in our model.

The assessment subsystem is the major focus of this paper. Figure 1 shows that assessment has direct and indirect influences on all other subsystems in the process function. Assessment in this model is continuous: it focuses upon the student, when he enters, and during his entire preparation. Therefore, the assessment subsystem is a logical starting point for systematic analysis of an on-going teacher education program.

Analysis of the assessment subsystem has led to a schema for continuous appraisal of candidates in a teacher education program. Figure 2 shows significant points in the assessment schema: phases, processes, procedures and decision alternatives, and major information sources. The schema depicts the cyclic character of assessment. As a result of this cyclic assessment the data in the teacher education program is continually maintained and up-dated.

More specifically the schema suggests four phases in this program; admissions, promotion, graduation, and certification levels. The student proceeds through these phases while he is being sequentially evaluated. As we will discuss later, the student in the teacher education program is not passive.

TEACHER EDUCATION SYSTEM MODEL

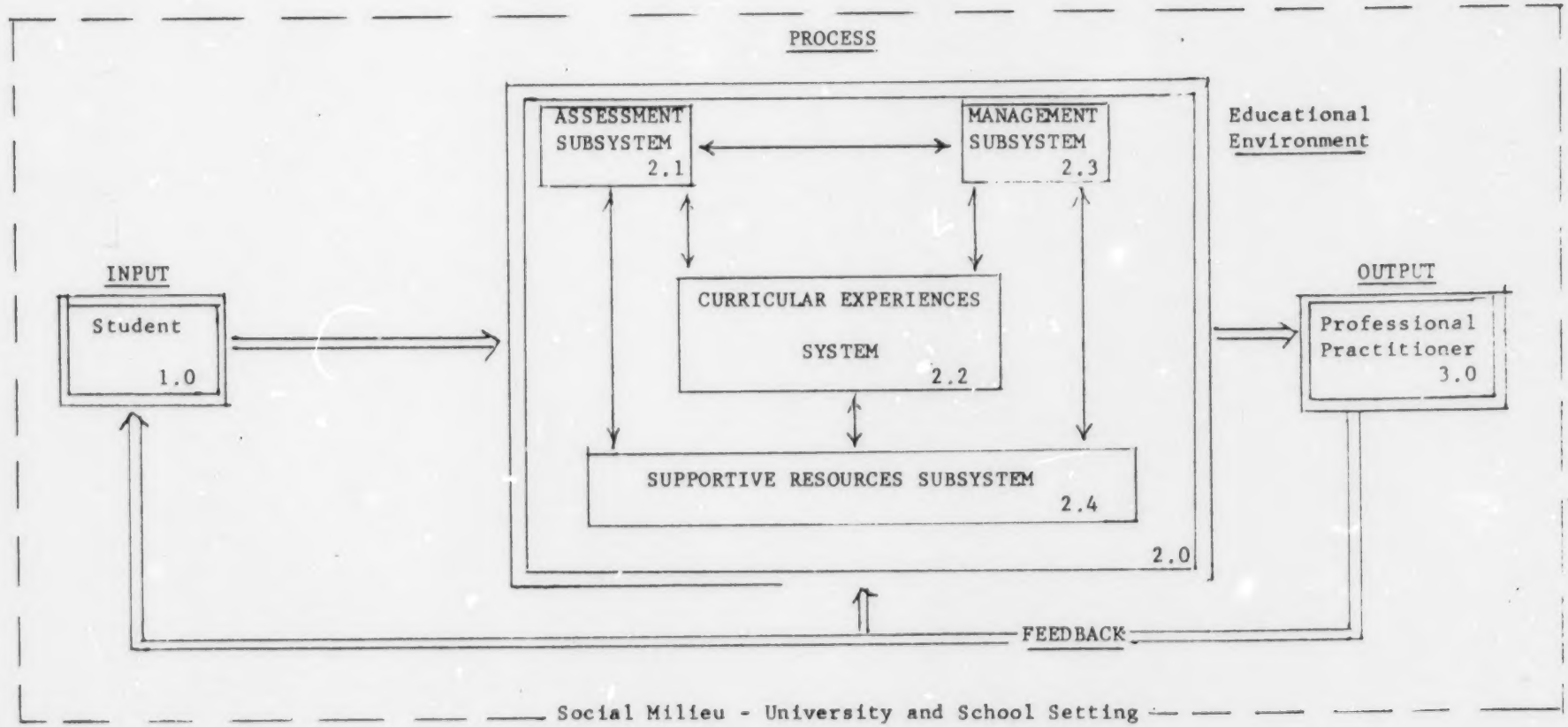

Figure 1

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SCHEMA FOR CONTINUOUS APPRAISAL OF TEACHER EDUCATION PROGRAM

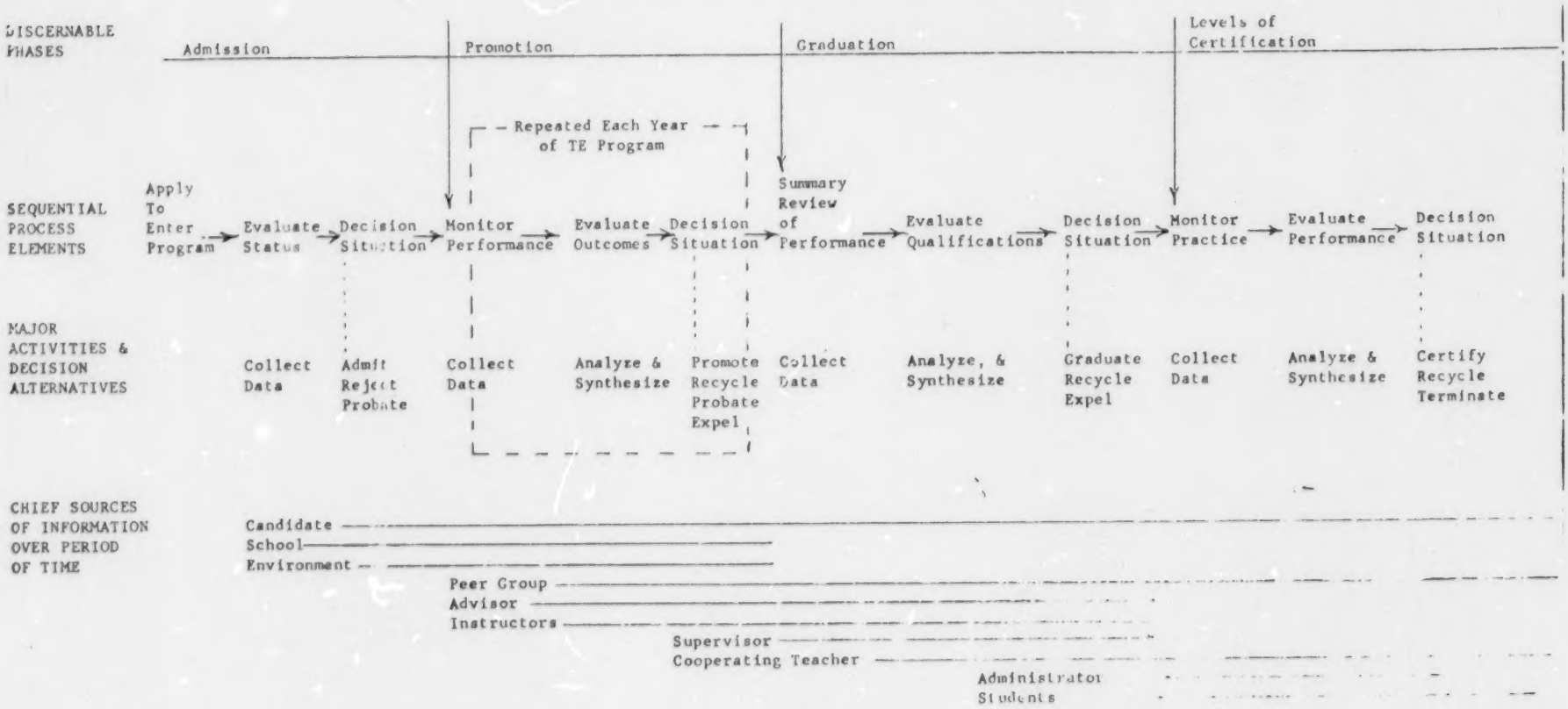

Figure 2

However, the schema lacks an important element. As one reviews this schema for continuous appraisal of teacher education it becomes apparent that the one missing ingredient is the criterion base upon which assessment decisions are based. This omission commonly occurs in most models of teacher education programs.

Numerous strategies for the development of a criterion base are available to educators (e.g., expert opinion, task analysis, model conceptualization, and empirical data base). For the development of relevant and meaningful criterion base data, our approach has been to focus on a major teacher activity--changing student behaviors. The criterion base developed in this paper addresses itself to the teacher role as a manager of learning experiences. It is recognized that other roles may and do exist which the teacher must fulfill. But, it is accepted that the manager of learning experiences constitutes the major role for the 1980's.

Our approach has led to the development of the model presented in Figure 3 which consists of environmental influences, teaching skills and support skills. Teaching skills are systematic problem-solving areas related to managing learning experiences. Included in the teaching skill area are activities identified as Knowledge of the Pupil, Development of objectives for Learning, Consideration of Models of Presentation, (experience configuration), Implementation of Modes of Presentation, Evaluation of Performance Outcomes, and Feedback. The other activity areas which make up the supportive skills are related to facilitating the managing of learning experiences. Included in these supportive skill areas are activities identified by Reinforcement, Pupil-Teacher Relationships, Knowledge of Academic Material, Stimulation of Pupil Interest in Learning, Relationship of Verbal and Non-Verbal Behavior to Subject Matter, Integration of Audio-visual Materials, Management of the Learning Area, and Question Asking. The synthesized performance of competencies of teacher skills and support skills result in the Manager of Learning Experiences' major activity--changing student behaviors.

Manager of Learning Experience Model

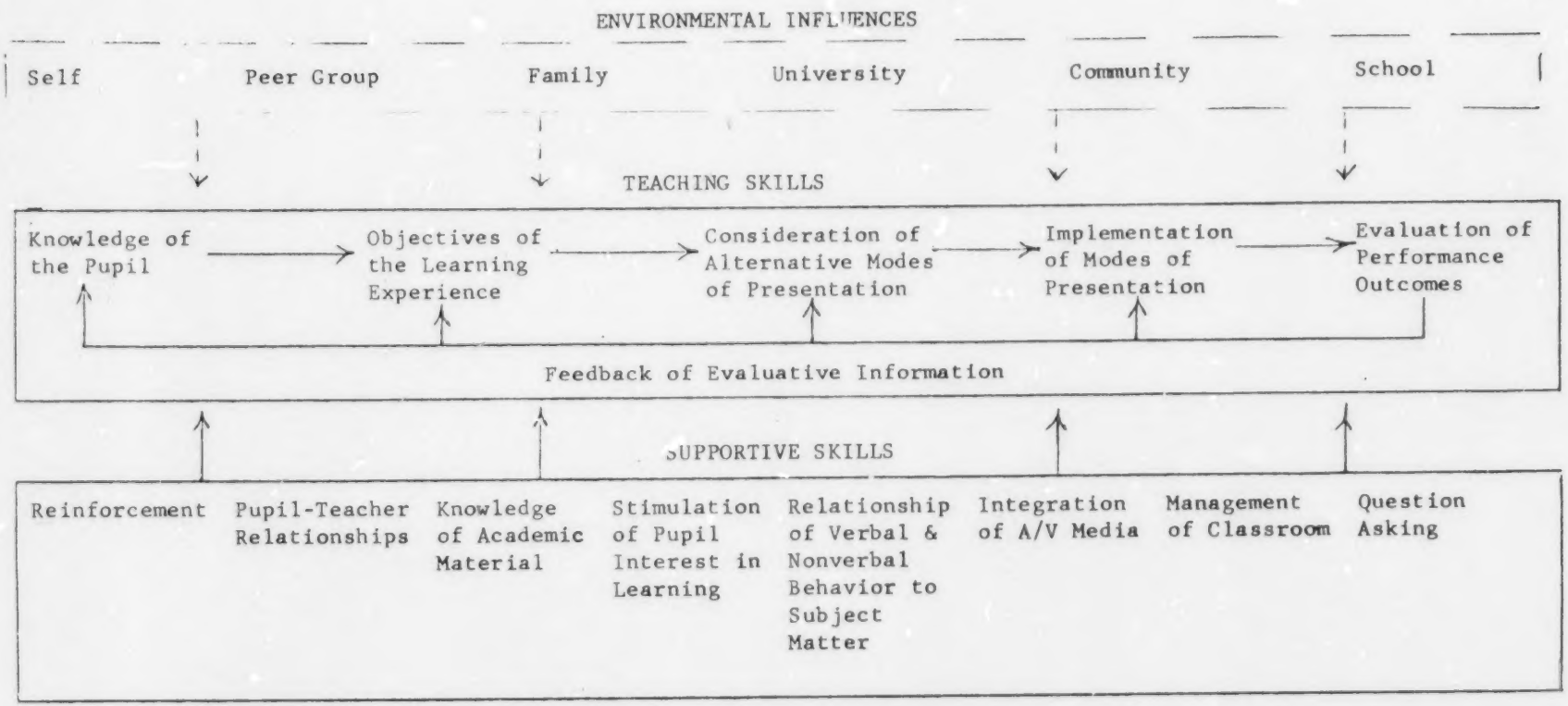

Figure 3

In the next section of this paper we describe the translation of these skill areas into a series of empirically based objectives and instructional strategies which would provide the information necessary to develop the criterion base for assessing the teacher education program. This translation is a part of a teacher education program implementation model which provides for the continuous assessment of objectives based on data from candidates both in the program and after graduation from the program. Later in this paper the overall model will be described.

Development of Teacher Education Program Objectives

The tentative acceptance of the teacher model serves as a guideline for selecting objectives for a teacher education program. In our initial pool of objectives we considered 156 statements which were ordered into 23 categories. These statements were both redundant in some areas and deficient in other areas. Thus, our preliminary work involved eliminating redundant statements, reducing the number of categories, and adding objective statements to fill out our model of the teacher as a manager of learning experiences. For example, in the teacher skill area, Consideration of Modes of Presentation, we have listed tentatively the following objectives:

1. able to search and assemble relevant information on implementation, evaluation, and feedback of alternative instructional techniques employed in a specified classroom within defined pupil characteristics;

2. able to classify information on implementation, evaluation, and feedback of alternative instructional techniques used in the classroom according to pupils' needs, content, objectives, and environmental conditions;

3. able to analyze information on implementation, evaluation and feedback of alternative instructional techniques employed in the classroom in terms of effectiveness and efficiency as it relates to objective attainment; and,

4. able to select alternative(s) instructional techniques focusing on implementation, evaluation, and feedback which provide for the highest level of objective attainment within known needs, requirements, constraints, and resources.

For another example, in the support skill area, Management of the Learning Area, we have listed these objectives:

1. able to modify room arrangements in response to situational changes;
2. able to set up room furniture and decoration to support learning;
3. able to set expectancies for student behavior;
4. able to reduce non-productive class time; and,
5. able to monitor learning activities.

Presently, the model for the teacher as a manager of learning experiences consists of 90 objectives arranged in 18 skill areas.

Development of Tentative Instructional Strategies

The transformation of a statement of objectives to an operational teacher education program is a giant step. In taking this step, we have developed 18 "tentative strategies" for meeting the skill area objectives. Each strategy we have labeled an "instructional capsule." These strategies have three components: objective, test, and performance. For example, the list of objective statements generated for the teaching skill area of Consideration of Modes of Presentation have been transformed into the following tentative strategy:

Objective

Given a structured set of learning experiences involving a series of readings, discussions, papers, and a simulation situation, the candidate will be able to:

1. search and assemble relevant information on implementation, evaluation, and feedback of alternative instructional techniques employed in a specified classroom within defined pupil characteristics;

2. classify information of implementation, evaluation, and feedback of alternative instructional techniques used in the classroom according to pupils' needs;

3. analyze information on implementation, evaluation, and feedback of alternative instructional techniques employed in the learning area in terms of effectiveness and efficiency as it relates to objective attainment; and,

4. select alternative(s) instructional techniques focusing on implementation, evaluation and feedback which provide for the highest level of objective attainment within known needs, requirements, constraints, and resources.

Test

1. Identify characteristics of learning area teaching situations to include: pupil learning deficits, pupil learning styles, constraints, and resources, learning objectives, environmental conditions, self-teaching style, and nature of content.

2. Match hypothetical pupil characteristics with constraints, resources, objectives, environmental conditions, and content to maximize performance of the hypothetical student.

Performance

Presentation of evidence through a report and a videotape of simulated instruction that the candidate has considered and analyzed instructional techniques focusing upon implementation, evaluation, and feedback, selected a technique "best" suited to the teaching-learning situation, and assessed the degree of objective attainment by selected techniques.

The candidate will prepare a learning experience for a teaching situation. The preparation will include an assessment of student characteristics, subject matter constraints, environmental objectives, and instructional objectives. These data will contribute to the candidate's identification of alternative instructional techniques.

The candidate will prepare two instructional techniques. One of these alternatives the candidate will identify as the "best" alternative. The "best" alternative instructional technique will be implemented in a 20-minute learning situation. The videotape of this presentation and any paper-and-pencil test results will be used by the candidate in his analysis of the instructional technique's effectiveness.

> The report containing the student characteristic assessment data, the "best" instructional technique's results, the videotape of the second presentation, and its data analysis will be submitted by the student to his instructor. Two of the candidate's peers and the instructor will evaluate the report with respect to the candidate's mastery of the objectives.[1]

In this tentative strategy we have specified the learning conditions in the objective component (Mager, 1962; Rahnlow, 1968). The textual input selected for the teacher education program - several instructional strategies for mastering the input, e.g., lecture, small group activities; independent study, observational tapes and films, and/or simulation; and other instructional conditions, are specified in the objective component. In the test component, we have indicated the to-be-learned procedures which the candidate must master. The performance component indicates the minimum frequency and variety of behaviors which the teacher education program candidate must perform in reaching mastery for the instructional capsule.

In the test component of the capsule we have specified the cognitive information area, in contrast with the behavioral area, which will be tested by a paper and pencil measure of the objective. The cognitive test, we plan, will be administered upon the teacher-candidate's request. In addition the candidate may retake the knowledge test until information mastery occurs.

A common problem in professional training occurs when the candidate performs at a high level, but he cannot complete the academic requirements. The performance portion of the instructional capsule's tentative strategy specifies the behavioral areas which will be tested. These performance checks which are derived from the objectives have a basic format of preparation, performance, evaluation, performance, reevaluation, and report (Allen and Ryan, 1969; Barclay, 1969). Videotape of the performance and a repeated performance, (e.g., Ivey, Normington, Miller, Morrill

and Haase, 1968), facilitates evaluation and report preparation. In our model for teacher education the instructional capsule reports are evaluated by the faculty and the candidate's peers. Thus, the instructional conditions, knowledge tests, and performance checks are organized into instructional capsules.

Each instructional capsule in the program stands dependent upon empirical evidence for their continued use in the program. A capsule's effectiveness in our model is determined by assessment results from performance by the candidates during the program and teachers after the program. In the event the desired behaviors are not performed, the capsule is analyzed for its internal consistencies and revised as needed. If the capsule and its objectives are simply bad -- not related to the behaviors of a teacher as a manager of learning experiences, then the capsule will be deleted from the program. A replacement, if necessary, then can be prepared and inserted into the program. Thus, the teacher education program itself can be revised capsule-by-capsule, as necessary.

This approach to teacher education program development and candidate assessment, in particular, has been developed to relate behavioral objectives for the candidate (arranged in a model of the teacher as a manager of learning experiences) to the students' behavior in a learning situation. It is the intent of this sequential development of models and examples to represent one approach to change in teacher education programs.

Implementation of Capsulized Teacher Education Program

Before this approach to change in teacher education can be undertaken, attitudinal and philosophical shifts must occur in the institutional and individual dimensions. First, the Colleges of Education and their host universities must shift their funds in a systematic manner to support change in teacher education. The Executive Committee of the National Association of Universities and Land

Grant Colleges has endorsed a seven-year plan providing for the gradual commitment of resources, teacher and support monies, to fundamental and systematic revision of teacher education programs, (Allen and Mackin, 1970). By 1976 fifty percent of the students and fifty percent of the resources would be committed to the revision of teacher education.

The second dimension for attitudinal and philosophical change is among the teacher-candidates and the faculty. These individuals will have to be oriented to an instructional capsule program for teacher education. Examples of changes in orientation for both candidates and faculty are:

Candidate

1. Must be prepared for frequent self assessment, setting goals and revising program of studies.
2. Should be prepared to engage in self initiated individualized instruction and maximum employment of instructional capsules at his own "best" pace.
3. Be prepared for evaluation of his peers and by his peers.

Faculty

1. Need for in-service orientation and training in relation to acceptance and management of change.
2. Must be prepared to enter into a cooperative interactive learning experience with each candidate in a quasi clinical setting.
3. Need for awareness and acceptance of attitudinal and philosophical concepts necessary to implement change.
4. Should be prepared for essential involvement and communication with candidates, public school practitioners, community, and lay citizens.

To implement this approach to change, a realistic plan is required. The plan is complex and will require an extended period for implementation. It is

proposed that the implementation stages for this effort will include the following types of activities:

- An extensive use of available information.
- Augmentation of this information with a comprehensive standard test battery.
- Administration and analysis of this test battery.
- Administration and analysis of follow-up behavioral criteria or measures.
- Continuous revision of selection criteria.
- Development of teacher education program expectancy tables.
- Development of discriminative function tables.
- Development of interest in teaching stimulation indicators and techniques.
- In-service training for both candidates and faculty in the use of predictive and discriminative tables and the interest simulation tools.
- Evaluation of the effectiveness of the resulting measurement information as a criterion base for decision-making.

A logical, longitudinal phasing-in of the program changes requires a four year schedule. The critical major activities for each year are shown in Table 1.

An analysis of these activities over the four year period reveals that they are cyclical in nature. Each succeeding cycle provides an information base which expands and increases its validity and reliability throughout the programmatic implementation. This feedback facilitates revision and improvement of the teacher education program criterion measures. Thus, the continuous development of the measures enables the assessment subsystem of the basic teacher education system model to more effectively and efficiently perform its function. The relationships among all the activities listed in Table 1 in this longitudinal plan for programmatic change are presented in Figure 4. This figure is an expansion of the assessment subsystem (2.1) in Figure 1.

The Candidate Assessment Model for Teacher Education (CAMTE) is a basic input-process-output feedback system adapted to an educational situation. In Figure 4 the input function, a set of tentative objectives and strategies derived from

MAJOR ACTIVITIES OVER TIME

Activities	Developmental Years 1	2	3	4
Develop Criteria	X			
Revise Criteria		X	X	X
Develop Test Battery	X			
Revise Test Battery		X	X	X
Administer Post Program Measures	X	X	X	X
Revise Post Program Measures		X	X	X
Administer Screening Devices	X	X	X	X
Revise Screening Devices		X	X	X
Develop Instructional Capsules		X		
Revise Instructional Capsules			X	X
Develop Simulation Experiences		X		
Revise Simulation Experiences			X	X
Develop Time Phases Knowledge Measures		X		
Revise Time Phases Knowledge Measures			X	X
Develop Orientation Programs		X		
Revise Orientation Programs			X	X
Analyze Data	X	X	X	X
Develop Expectancy & Discriminative Function Tables			X	
Revise Expectancy & Discriminative Function Tables				X
Develop Stimulation Techniques			X	
Revise Stimulation Techniques				X

Table 1

A STUDENT ASSESSMENT MODEL FOR TEACHER EDUCATION (SAMTE)

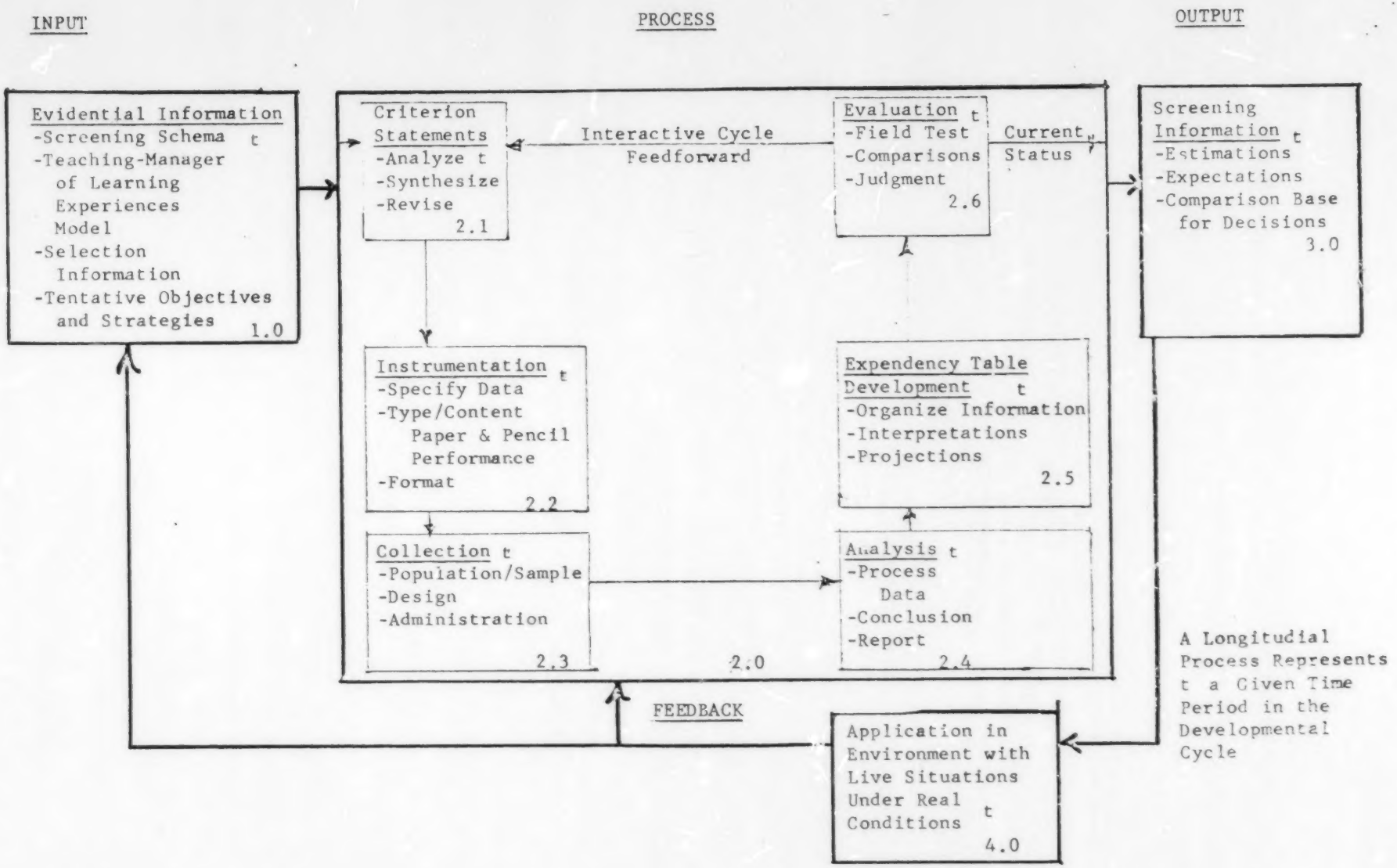

Figure 4

the model and a test battery for gathering selection. This function provides input to the process function, Development Operations (2.0).

In the process function we have identified six components: criterion statements, instrumentation, collection of data, analysis of data, development of expectancy tables and evaluation. Within this function the information from the program evaluation component may either feedback to the criterion statements in an iterative cycle or move to the output function, Screening Information (3.0).

The output function provides a sequence of matches between the model's objectives and the teacher-candidates' level of performance. The components of the output function are entering behaviors, anticipated levels of performance, expectations derived from the program model's objectives, comparisons between program objectives and the candidate's actual performance and a decision before permitting the candidate to enter the live teaching situation as a manager of learning (4.0). This decision situation is a part of the schema presented in Figure 2.

Feedback within the process function has been pointed out. However, a larger feedback loop exists from 4.0 and 3.0 to both 2.0 and 1.0. This feedback loop provides empirically based information. It is this continuously returning information that suggest revisions to the screening functions, instructional capsules, expectancy tables, program function, and post program data collection. The effect of this continuous feedback is to update the input criteria and the actual teacher education program process.

Prototype Implications

The implications from this prototype for change in teacher education can be divided into three areas. Briefly these implications will be presented and discussed:

1. Teacher Education Program
   a. The "courses" of the study, e.g., introduction to American education, the learner, methods and special methods, and

practice teaching will be reorganized into a curriculum based on the instructional capsule unit;

b. The teacher candidates will have to be oriented to working with capsulized instruction. In this new learning experience the candidates will be exposed, often for the first time, to making multiple decisions about their own "best" rate for learning. Thus, for some teacher-candidates more supervisory structure will have to be provided than for other candidates. This structured supervision will be gradually removed as the candidate gains facility in his working with capsulized instruction;

c. The teacher candidates will be learning how to mold the management of their own learning experiences. In this implication we are saying that students will imitate even the most complex skills of their teachers, particularly when the teachers are rewarded for their behaviors (Bandura, 1969);

d. The teacher candidates will learn how to judge and how to be judged by their peers. A new teacher often applied extreme kinds of judgments on his pupils (either too harsh or too lenient). The frequent practice in applying criteria even upon his peers should have the effect of stabilizing the teacher-candidate's application of criteria;

e. Instructional faculty and field work staff should receive extensive in-service preparation for permitting high level of candidate participation in decision-making, evaluation, and innovation. The expected behaviors of teacher-candidates will often appear to be as equals with the faculty and staff;

f. The issue of accountability in teacher training should be abundantly clear to both the candidate and his related faculty members. The candidate's entry levels of knowledge and performance will be analyzed in terms of instructional capsules that must be mastered in order for the candidate to reach the program's minimum levels of mastery. Faculty and candidates who plan based on this information can be held accountable for learning -- gaining knowledge and performance skills -- within an instructional capsule and within the program; and,

g. The change in teacher education should integrate the progessional, general and specialized component through a continuous faculty-student learning team.

2. Public School Systems

a. An in-service training program for other teachers, principals, and pupil personnel workers should be undertaken to prepare them for work with the manager of (a student's) learning experiences. This new teacher in some behavioral respects, might

be familiar to other school staff members; but, intoto, the manager will not be familiar to many of his colleagues;

b. An orientation of students and their parents to the teacher who will expect the student to manage his own learning experiences should be developed and implemented. Often students are trained to follow explicitly-given directions, but not how to manage their own learning experiences. The teacher-managers will have to provide successively smaller amounts of supervision as some students acquire their own management skills;

c. Principals will be able to hire teacher-staffs either on the basis of specific objectives mastered or on the basis of how rapidly the potential staff member mastered the list of objectives. The former consideration should result in "faculty balance" among the repertoire of teacher-manager behaviors. The latter consideration should influence the pace or style of management, since both teachers might have nearly the same behaviors in their repertoires; and,

d. The focus of American education is upon accountability, individualized instruction, and the employment of people who can be responsive to these concerns. The teacher as a manager of learning experiences can help to meet these needs.

3. Community

a. Students trained by the manager of learning experiences should acquire many of the same management skills, i.e., they should apply management skills to their own living experiences. In this way they will identify and predict relationships within their environment. Once the student can identify and predict relationships, he can choose his own action (control his own experiences to his advantage). The student then becomes independent, free, even responsible within his environment before entering the community.

This paper has presented a summarized perspective of a change model based on system analysis application to teacher education. The critical missing link in teacher education, the criterion base, has been specified in model form. This model is an attempt to establish an empirical criterion base from which viable and valid decisions can be made regarding "what makes a good teacher" and "how do we know when we have a 'good' teacher?" Accountability in teacher education is not an alternative but a societal demand. The worth of this model will only be

determined by its implementation in the real world. Its degree of success may provide valuable information for change in teacher education. If teacher education does not change, it will not be.

Acknowledgement: The authors wish to gratefully acknowledge the stimulation and professional interaction obtained from the members of the College of Education's ad hoc Committee on Criteria for Career Success in Teaching; C. F. Elton, Chairman, J. Dettre, D. L. Larimore, and E. Minor.

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